

Chapter 8

R645-301-800 Bonding and Insurance

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Chapter 8 Bonding

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R645-301-800 Bonding

This chapter describes bonding and reclamation cost estimates for Co-Op Mining Company.

R645-301-830 Determination of a Bond Amount

Reclamation Cost and Bonding

Labor Hourly Rates from 1998 Means Site Work Cost Data and CAT performance handbook,

Equipment Operator	= 47.15
Truck Driver	= 36.60
Laborer	= \$32.50
Labor foreman	= \$44.70
Crane Operator	= 47.15

Equipment Hourly Rates from 1998 Means Site Work Cost Data (Rate includes monthly rental and operating cost)

a.	01590-200-4560 Front End Loader - Cat 980 (6 cu yd bucket) Operator	\$ 96.82 <u>45.95</u> \$142.77
b.	01590-600-2500 Crane - 25 Ton Capacity (\$538.85 /day) Operator	\$ 86.57 <u>47.15</u> \$133.72
c.	01590-200-4360 Cat - D9N - Operator	\$144.85 <u>45.95</u> \$190.80
d.	01590-200-0300 Backhoe (Cat 330BL) Operator	\$107.18 <u>45.95</u> \$153.13
e.	02320-200-0320 Dump Truck (6 Ton) Operator	\$ 66.38 <u>36.60</u> \$ 102.98
f.	6 X 4 45,000 lbs 8-10 CY (20-1) (2QCD) Truck Operator	\$ 31.78 <u>36.60</u> \$ 68.38

Backhoe (BH) Cycle Time Estimates - 330BL Backhoe

(From Cat Performance Handbook)

Average

Load Bucket	5.4 Sec
Swing Bucket	4.2 Sec
Dump Bucket	2.4 Sec
Swing Empty Bucket	<u>4.2 Sec</u>
	16.2 Sec - 1.83 cu yd

Medium to hard digging (hard packed soil with up to 50 pct rock content) depth to 70 pct of machine's capability.

$(5.22 \text{ cycles/min})(1.83 \text{ cu yd})(60) = \text{production/hr} = 573.6 \text{ cu yd/hr}$ (222 cycles/hr)

Efficiency - 50 min/hr - $(406 \text{ cu yd/hr})(50 \text{ min}/60 \text{ min}) = \underline{478 \text{ cu yd/hr}}$ (185 cycles/hr)

Crawler Tractor (D9) Production Estimates (From Cat performance Handbook)

D9 Average dozing distance - 200 ft

Average Blade Load of 18.8 cu yd

From Production Chart, Production = 680 cu yd/hr

- | | | |
|----|-------------------------------------|------|
| a. | Hard-packed or hard to cut material | 0.80 |
| b. | Job efficiency (55 min/60 min) | 0.92 |

Dozing Production = $(680 \text{ cu yd/hr})(0.80)(0.92) = \underline{500 \text{ cu yd/hr}}$

Ripping:

From Production chart for seismic velocity = 3.5

Production = 1,750 cu yd/hr

Efficiency 55 min/hr

Ripping Production = $(1,750 \text{ cu yd/hr})(0.92) = \underline{1,610 \text{ cu yd/hr}}$

980 Loader Cycle Time

(From Cat Performance Handbook)	0.55 min
a. 3/4 inch to 6 inch	0.00 min
b. Pile (10 ft or less)	+ 0.01 min
c. 3/4 inch to 6 inch	- 0.04 min
	0.52 min

$(60 \text{ min/hr}) / (0.52 \text{ min/cycle}) = 115.4 \text{ cycles/hr}$

Efficiency $50 \text{ min/hr} - (115.4 \text{ cycles/hr})(6 \text{ cu yd/cycle})(50 \text{ min}/60 \text{ min}) = \underline{577 \text{ cu yd/hr (96 cycles/hr)}}$

Summary of Reclamation Cost Estimate

Direct Costs

a. Seal Portals and Backfill	\$ 112,500
b. Removal of Structures	\$ 210,403
c. Soil Placement and Ripping	\$ 178,617
d. Channel Restoration	\$ 403,728
e. Revegetation	\$ 462,968
f. Monitor Well Plugging	<u>\$ 5,000</u>

Total Direct Costs: \$ 1,373,216

Indirect Costs

g. Maintenance and Monitoring (10%)	\$ 137,322
h. Contingency (5%)	\$ 68,661
i. Engineering Redesign (2.5%)	\$ 34,330
j. Mobilization and Demobilization (5%)	\$ 68,661
k. Contract Management Fee (2.5%)	<u>\$ 34,330</u>

Total Indirect Costs: \$ 343,304

Total Reclamation Cost (2001 dollars) \$ 1,716,520

<u>Escalated Values</u>	<u>Escalation Factor</u>
2002 - 1,770,075	3.12% (est)
2003 - 1,825,302	3.12% (est)
2004 - 1,882,251	3.12% (est)
2005 - 1,940,978	3.12% (est)

The total bond currently posted, rounded to the nearest \$1,000, is **\$1,825,000**.

Reclamation Costs

a. Seal and Backfill Portals

AMR Costs- \$ 12,500/seal including backfill x 9 seals \$112,500

b. Removal Structures

All estimates with 10 digit numbers are from 2001 Means Site Work cost Data. Most of the steel and equipment will be salvaged for scrap or reuse. M&P Enterprises in Huntington, Utah, will pick up and pay \$40.00/ton for scrap iron & equipment if placed in 30 cu yd (8ft wide x 20 ft long x 5 ft high) dumpsters or loaded with crane on their trucks. Reclamation costs assume the steel will be picked up on site, but the mine receives no payment for the steel. D&R Salvage in Castle Dale will accept the steel without a dump fee. Therefore no dump fee is included for steel. Means cost data includes disposal to 20 miles, which is the approximate distance to the Nielson Construction landfill in Emery County. Dump fee for Nielson Construction landfill is \$7.00 typically.

Sales-Receiving-Scale House Complex

02220-100-0100 (Mixture type Building, includes disposal)

Volume = (34 ft) (83 ft) (16 ft) = 45,152 cu ft

Cost = (\$ 0.24 /cu ft) (45,152 cu ft) = \$ 10,837

Dump Fee = ((45,152 cu ft) / 27) * 0.3 rubble volume * 1.35 tons/cy) (\$7.00/ton) = \$4,741

Time = (45,152 cu ft) / (20,100 cu ft/day) = 2.25 days

Concrete Demolition

Total Footing Volume =(0.67 ft)(2 ft)(234 ft) = (313.6 cu ft) / 27 = 11.6 cu yds

Total Foundation Volume = (0.67 ft)(4 ft)(234 ft) = (627.1 cu ft) / 27 = 23.2 cu yds

Floor Volume = (83 ft)(34 ft)(0.33 ft) = (931.3 cu ft) / 27 = 34.5 cu yds

Total Volume = 69.3 cu. yds

Cost = (69.3 CY) (\$12.78/CY) = \$886

Time = (234 L.F.)/(300 L.F./day) + (234 ft)(4 ft)/(140 s.f./day) + (83 ft)(34 ft)/(500 s.f./day) = 13.10 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Cost = (\$10.69/cu. yd.) (69.3 cu yds) (1.3 swell factor) = \$963

Time = 90.1 cu. yds. / (232 cu. yds./day) = 0.40 days

Cost Subtotal	\$17,427
Time Subtotal	15.75 days

Scalehouse Area Pavement

02220-875-1750 (Pavement Removal 3")

Area = 800 square yards

Cost = (\$ 3.85 /sq yd) (800 sq yd) = \$ 3,080

Time = (800 sq yd) / (420 sq yd/day) = 1.90 days

Disposal at landfill

Volume = (67 CY) (2 tons/yd) (1.3 swell factor) = 174 Tons

16 ton truck; distance to haul approx. 40 miles round trip = 3 trips/day

Time = (67 cu yd)/(48cu yd/day) = 1.4 days

Dump Fee = (174 Tons) (\$7.00/ton) = \$1,218

01590-200- 5300 Dump Truck Cost = (\$ 823.88/day) (1.4 days) = \$ \$ 1,154

Cost Subtotal \$ 5,452

Time Subtotal 3.3 days

Shower House

02220-100-0100 (Framed Portion, includes disposal)

Volume = (92 ft) (50 ft) (8 ft) = 36,800 cu ft

Cost = (\$ 0.24 /cu ft) (36,800 cu ft) = \$ 8,832

Dump Fee = ((36,800 cu ft) / 27) (0.3 rubble volume) (1.35 tons/cy) (\$7.00/ton) = \$3,864

Time = (36,800 cu ft) / (20,100 cu ft/day) = 1.83 days

02220-100-0080 (Masonry Portion, includes disposal)

Volume = (92 ft) (50 ft) (8 ft) = 36,800 cu ft

Boot wash Volume = (12 ft) (5.5 ft) (8 ft) = 528 cu ft

Cost = (\$ 0.24 /cu ft) (37,328 cu ft) = \$ 8,959

Dump Fee = ((37,328 cu ft) / 27) (0.3 rubble volume) (1.35 tons/cy) (\$7.00/ton) = \$3,919

Time = (37,328 cu ft) / (20,100 cu ft/day) = 1.86 days

Concrete Demolition

Foundation Volume = (0.67 ft) (2 ft) (284 ft) = (380.6 cu ft) / 27 = 14.1 cu yds

Footing Volume = (0.67 ft) (2 ft) (319 ft) = (427.5 cu ft) / 27 = 15.8 cu yds

Floor Volume = (92 ft) (50 ft) (0.33 ft) = (1518 cu ft) / (27) = 56.2 cu yds

Boot wash Floor Volume =(12 ft) (5.5 ft)(0.33 ft) = (21.8) / 27 = 0.81 cu yds

Total Volume = 86.9 cu yds

Cost = (86.9 CY) (\$12.78/CY) = \$1,111

Time = (638 s.f.) / (180 s.f./day) + (319 L.F.) / (300 L.F./day) + (4,666 s.f.) / (500 s.f./day) = 13.94 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = (86.9 CY) (1.3 swell factor) = 113.0

Cost = (113 CY) (\$10.69/CY) = \$1,208

Time = (113 cu. yds) / (232 cu. yds/day) = 0.49 days

Cost Subtotal \$ 27,893

Time Subtotal 18.12 days

Shop

02220-100-0012 (Steel Building, includes disposal)

Volume = (40 ft) (93 ft) (14 ft) = 52,080 cu ft

Cost = (\$ 0.22 /cu ft) (52,080 cu ft) = \$ 11,458

Time = 52,080 cu ft / (21,500 cu ft/day) = 2.42 days

Concrete Demolition

Foundation Volume = (0.67 ft) (4 ft) (197.5 ft) = (649.7 cu ft) / 27 = 24.1 cu yd

Footing Volume = (0.67 ft) (2 ft) (266 ft) = (356.4 cu ft) / 27 = 13.2 cu yd

Floor Volume = (40 ft) (93 ft) (0.33 ft) = (1,228 cu ft) / 27 = 45.5 cu yd

Total Volume = 82.8 cu yd

Cost = (82.8 cu yd) (\$12.78/cu yd) = \$1,058

Time = (790 s.f.) / (140 s.f./day) + (266 L.F.) / (300 L.F./day) + (3,720 s.f.) / (400 s.f./day) = 9.30 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = (82.8 cu yd) (1.3 swell factor) = 107.6 cu yd

Cost = (107.6 cu yd) (\$10.69/cu yd) = \$1150

Time = (107.6 cu yd) / (232 cu yd/day) = 0.46 days

Cost Subtotal	\$13,666
Time Subtotal	12.18 days

Machine Shop

02220-100-0012 (Steel Building, includes disposal)

Volume = (30 ft) (45 ft) (10 ft) = 13,500 cu ft

Cost = (\$ 0.22 /cu ft) (13,500 cu ft) = \$ 2,970

Time = (13,500 cu ft) / (21,500 cu ft/day) = 0.63 days

Concrete Demolition

Foundation Volume = (0.67 ft) (1 ft) (135 ft) = (90.5 cu ft) / 27 = 3.4 cu yd

Footing Volume = (0.67 ft) (2 ft) (150 ft) = (201 cu ft) / 27 = 7.4 cu yd

Floor Volume = (30 ft) (45 ft) (0.33 ft) = (445.5 cu ft) / 27 = 16.5 cu yd

Total Volume = 27.3 cu yd

Cost = (27.3 cu yd) (\$12.78cu yd) = \$349

Time = (135 s.f.) / (140 s.f./day) + (150 L.F.) / (300 L.F./day) + (1,200 s.f.) / (400 s.f./day) = 4.46 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Total Volume = (27.3 cu yd) (1.3 swell factor) = 35.5 cu yd

Cost = (\$10.69 /cu yd)(35.5 cu yd) = \$380

Time = (35.5 cu yd) / (232 cu yd/day) = 0.15 days

Cost Subtotal	\$ 3,699
Time Subtotal	5.24 days

Hilfiker Retaining Wall

02220-100-0012 (Steel Building, includes disposal)

$$\text{Volume} = (1,584 \text{ sq ft}) (0.02 \text{ ft}) = 32 \text{ cu ft}$$

$$\text{Cost} = (32 \text{ cu ft}) (\$0.22/\text{cu ft}) = \$7$$

$$\text{Dump Fee} = (32 / 27 \text{ cu yd}) (0.3 \text{ Demolished volume}) (1.35 \text{ Ton/cu yd}) (\$7.00/\text{Ton}) = \$3$$

$$\text{Time} = (32) / (21,500 \text{ cu ft/day}) = .01 \text{ days}$$

Cost Subtotal \$10

Time Subtotal .01 days

Coal Processing/Crusher Facility (Tipple)

Primary Structure = 27 ft x 40 ft Approx. (25% is 25 ft high, 50% is 17 ft high, and 25% is 8 ft high.)

Secondary Structure = 20 ft x 30 ft x 51 ft high

02220-100-0012 (Steel Building, includes disposal)

$$\text{Volume}_1 = (27 \text{ ft}) (40 \text{ ft}) [(25\%) (25 \text{ ft}) + (50\%) (17 \text{ ft}) + (25\%) (8 \text{ ft})] = 18,090 \text{ c.f.}$$

$$\text{Volume}_2 = (20 \text{ ft}) (30 \text{ ft}) (51 \text{ ft}) = 30,600 \text{ c.f.}$$

$$\text{Cost} = (\$0.22 / \text{cu ft}) (48,690 \text{ cu ft}) = \$10,712$$

$$\text{Dump Fee} = (48,690 / 27 \text{ cu yd}) (0.3 \text{ Demolished volume}) (1.35 \text{ Ton/cu yd}) (\$7.00/\text{Ton}) = \$5,113$$

$$\text{Time} = (48,690 \text{ cu ft}) / (21,500 \text{ cu ft/day}) = 2.26 \text{ days}$$

02220-100-0100 (Control House, Mixture type, includes disposal)

$$\text{Volume} = (12 \text{ ft})(20 \text{ ft})(10 \text{ ft}) = 2,400 \text{ cu ft}$$

$$\text{Cost} = (\$0.24 / \text{cu ft}) (2,400 \text{ cu ft}) = \$576$$

$$\text{Dump Fee} = (2400 / 27 \text{ cu yd}) (0.3 \text{ Demolished volume}) (1.35 \text{ Ton/cu yd}) (\$7.00/\text{Ton}) = \$252$$

$$\text{Time} = (2,400 \text{ cu ft}) / (20,100 \text{ cu ft/day}) = 0.12 \text{ days}$$

Concrete Demolition

$$\text{Primary Structure Footings} = (2 \text{ ft} \times 2 \text{ ft} \times 1.5 \text{ ft} \times 11) / 27 = 2.4 \text{ cu yd}$$

$$\text{Secondary Structure Footings} = (3 \text{ ft} \times 3 \text{ ft} \times 2 \text{ ft} \times 4) / 27 = 2.6 \text{ cu yd}$$

$$\text{Primary Structure Floor} = (27 \text{ ft} \times 40 \text{ ft} \times (3.5"/12)) / 27 = 11.7 \text{ cu yd}$$

$$\text{Secondary Structure Floor} = (20 \text{ ft} \times 30 \text{ ft} \times (3.5"/12)) / 27 = 6.5 \text{ cu yd}$$

$$\text{Total Volume} = 2.4 + 2.6 + 11.7 + 6.5 = 23.2 \text{ cu yd}$$

$$\text{Cost} = (23.2 \text{ cu yd}) (\$12.78/\text{cu yd}) = \$297$$

$$\text{Time} = (38 \text{ L.F.}) / (300 \text{ L.F./day}) + (1,680 \text{ s.f.}) / (400 \text{ s.f./day}) = 4.33 \text{ days}$$

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

$$\text{Total Volume} = (23.2 \text{ cu yd}) (1.3 \text{ swell factor}) = 30.2 \text{ cu yd}$$

$$\text{Cost} = (\$10.69 / \text{cu. yd.}) (30.2 \text{ cu yds}) = \$323$$

$$\text{Time} = (30.2 \text{ cu yds}) / (232 \text{ cu yds/day}) = 0.13 \text{ days}$$

Cost Subtotal \$ 17,273

Time Subtotal 6.81 days

Substation Power Transformers

Bear Canyon and Wild Horse Ridge Substations:

- (8) Steel I-columns spaced 16 ft apart:
(4) 12 in x 5½ in x 32ft columns and
(4) 7 in x 4.5 in x 32 ft columns.
(17) 7 in x 4.5 in x 16 ft I-beams.

Average beam/column thickness approx. ⅜ in. Cut each column and beam twice.

Cut length = 2 cuts [(4 members) (12 in + 11 in) + (21 members) (7" + 9")] = 856" = 71 ft.

Assume ½ in plate can be cut twice as fast as 1" plate, etc.

02220-790-0010 (Torch Cutting, 1 in Plate)

Equivalent length for 1 in plate) = (⅜) (71 ft) = 26.6 ft

Cutting Cost = (\$8.95 /ft) (26.6 ft) = \$238

Cutting Time = (26.6 ft) / (85 ft/day) = 0.31 days

02220-300-1570 (750 KVA Transformer)

Cost = 6 Transformers x \$665/trans. = \$3,990

Time = 6 Trans / (0.45/day) = 13.33 days

Equipment Loading

Assume each beam takes 10 min average and each transformer, etc. takes 20 min average to load with crane.

Transformers, etc.

Time = (25 pieces) (10 min) + (6 pieces) (20 min) = 6.2 hrs = 0.77 days

01590-600-2500 (Crane Loading)

Crane + operator = (6.2 hrs) (\$133.72 /hr) = \$846

01590-200-5300 (Dump Truck and CLAB)

Truck + operator = (6.2 hrs) (\$102.99/hr) (2) = \$1,277

CLAB = (6.2 hrs) (\$35.75/hr) (2) = \$443

Concrete Demolition

Slab Volume=(19 ft) (19ft) (6/12) = (180.5 cu ft) / 27 = 6.69 CY x 2 slabs = 13.4 cu yd

Cost = (\$12.78 /cu yd) (13.4 cu yd) = \$171

Time = 13.4 cu yd / (45 cu yd/day) = 0.30 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = 13.4 cu yd x 1.3 swell factor = 17.4 cu yd

Cost = (\$10.69 /cu yd) (17.4 cu yd) = \$186

Time = (17.4 cu yd) / (232 cu yd/day) = 0.08 days

02220-875-0700 (Chain Link Fence)

Length = 157 ft x 2 = 314 ft

Cost = (\$2.51/ft) (314 ft) = \$ 788

Time = (314 ft) / (280 ft/day) = 1.12 days

Cost Subtotal	\$ 7,939
Time Subtotal	15.91 days

Coal Storage Bin

Approx. 20 ft x 20 ft high bin ($\frac{1}{2}$ in plate with stiffeners, tapers down at bottom) with (4) 12 in I-beams (30 ft legs) and angles for cross bracing.

Cut into pieces and load in dumpster. Assume average thickness of bin w/stiffeners, etc. equal to $\frac{5}{8}$ in plate. Cut each side 3 places and each leg twice.

Approx cut length = (3 cuts) (4 sides) (20 ft) + (2 cuts) (4 legs) ($32 \text{ in} / 12$) = 261.3 ft

02220-790-0010 (Torch Cutting, 1 in Plate)

Equivalent length (For 1 in plate) = ($\frac{5}{8}$) (261.3 ft) = 163.3 ft

Cutting cost = (\$8.95 /ft) (163.3 ft) = \$1,462

Cutting time = (163.3 ft) / (32 ft/day) = 5.10 days

01590-600-2500 (Crane - 25 Ton), 01590-200-5300 (Dump Truck - 16 Ton)

Assume each piece takes 20 min. average to load in dumpster with crane after cutting.

Number of pieces = 12 plates + 4 legs = 16 pieces

Time = 16 (.33 hr) = 5.28 hrs

Crane + operator = (5.28 hrs) (\$ 132.52 /hr) = \$700

Dump Truck = (5.28 hrs) (\$102.99/hr) (2) = \$1088

CLAB = (5.28 hrs) (\$35.75/hr) (2) = \$378

Time = 0.66 days

Concrete Demolition

Wall Volume = (60 ft) (6 ft) (1ft) = 360 cu ft

Footing Volume = (4) (3 ft) (3 ft) (1 ft) = 36 cu ft

Slab Volume = (30 ft) (30 ft) ($8''/12$) = 600 cu ft

Volume = 360 + 36 + 600 = 996 cu ft / 27 = 36.9 cu yd

Cost = (\$12.78 /cu yd) (36.9 cu yd) = \$ 472

Time = (36.9 cu yd) / (35 cu yd/day) = 1.05 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = 36.8 cu yd * 1.3 swell factor = 47.8 cu yd

Cost = (\$10.69/cu yd) (47.8 cu yd) = \$511

Time = (47.8 cu yd) / (232 cu yd/day) = 0.21 days

Cost Subtotal	\$ 4,612
Time Subtotal	7.02 days

Lump Coal Bin

Approx. 30 ft x 36 ft x 20 ft high bin ($\frac{1}{2}$ in plate with leg/stiffeners around outside, tapers down at bottom). Cut into pieces and load in dumpster. Assume average thickness of bin with stiffeners, etc. equal to $\frac{5}{8}$ in plates.

Cut 2 Sides 4 places and 2 sides 5 places.

Approx. cut length = (4 cuts) (2 sides) (20 ft) + (5 cuts) (2 sides) (20 ft) = 360 ft

02220-790-0010 (Torch Cutting, 1 Plate)

Equivalent length (for 1 in plate) = ($\frac{5}{8}$) (360 ft) = 225 ft

Cutting cost = (\$ 8.95/ft) (225 ft) = \$ 2,014

Cutting time = 225 ft / (32 ft/day) = 7.03 days

01590-600-2500 (Crane - 25 Ton), 01590-200-5300 (Dump Truck - 16 Ton)

Assuming each piece takes 10 min. average to load in dumpster with crane after cutting.

Number of pieces = 18 plates + 8 legs = 26 pieces

Time = 26 (0.17 hrs) = 4.42 hrs

Crane + operator = (4.42 hrs) (\$ 133.72/day) = \$591

Dump Truck = (4.42 hrs) (\$102.99/hr) (2) = \$910

CLAB = (4.42 hrs) (\$35.75/hr) (2) = \$316

Time = 0.55 days

Concrete Demolition

Footing Volume = [2 (36ft) + 30 ft] (2ft) (1ft) = 204 cu ft / 27 = 7.56 cu yd

Cost = (\$12.78/cu yd) (7.56 cu yd) = \$97

Load and Haul = (7.56) (1.3 swell factor) (\$4.39) = \$43

Time = (7.56 cu yd) / (25 ft/day) = 0.30 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = 7.56 cu yd * 1.3 swell factor = 9.8 cu yd

Cost = (\$ 10.69/cu yd) (9.8 cu yd) = \$ 105

Time = (9.8 cu yd) / (232 cu yd/day) = 0.04 days

Cost Subtotal \$ 4,033

Time Subtotal 7.92 days

Coal Recovery Bin Foundation

02220-875-5200 (Reinforced Concrete)

Volume = (2.5 ft) (1 ft) (12 ft) (4) + (12 ft) (12 ft) (0.33 ft) = (167.52 cu ft) / 27 = 6.2 cu yd

Cost = (\$12.78/cu yd) (6.2 cu yd) = \$79

Time = (6.2 cu yd) / (25 cu yd/day) = 0.25 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = 6.2 cu yd * 1.3 swell factor = 8.1 cu yd

Cost = (\$ 10.69/cu yd) (8.1 cu yd) = \$87

Time = (8.1 cu yd) / (232 cu yd/day) = 0.03 days

Cost Subtotal \$ 166

Time Subtotal 0.28 days

Wild Horse Ridge Coal Storage Bin

Approx. 30 ft high x 50 ft diameter bin ($\frac{1}{2}$ in plate with stiffeners, tapers down at bottom) with (4) 12 in I-beams (30 ft legs).

Circumference = 157 ft.

Cut into pieces and load in dumpster. Assume average thickness of bin w/stiffeners, etc. equal to $\frac{5}{8}$ in plate.

Cut sides into 20 ft x 8 ft pieces and each leg twice.

Approx cut length = (3 cuts)(157 ft) + (8 cuts)(30 ft) + (2 cuts) (4 legs) (32 in / 12) = 732.3 ft

02220-100-0010 (Torch Cutting, 1 in Plate)

Equivalent length (For 1 in plate) = ($\frac{5}{8}$) (732.3 ft) = 457.7 ft

Cutting cost = (\$8.95 /ft) (457.7 ft) = \$4,096

Cutting time = (457.7 ft) / (32 ft/day) = 14.3 days

01590-600-2500 (Crane - 25 Ton), 01590-200-5300 (Dump Truck - 16 Ton)

Assume each piece takes 10 min. average to load in dumpster with crane after cutting.

Number of pieces = 32 plates + 8 legs = 40 pieces

Time = 40 (.17 hr) = 6.80 hrs

Crane + operator = (6.80 hrs) (\$133.72 /hr) = \$909

Truck + operator = (6.80 hrs) (\$102.99 /hr) (2) = \$1400

CLAB = (6.80 hrs) (\$35.75 /hr) (2) = \$486

Time = 0.85 days

Concrete Demolition

Wall Volume = (120 ft) (6 ft) (0.67 ft) = 482 cu ft

Footing Volume = (4) (3 ft) (3 ft) (1 ft) = 36 cu ft

Slab Volume = (60 ft) (50 ft) (0.5 ft) = 1,500 cu ft

Volume = 482 + 36 + 1,500 = cu ft / 27 = 74.7 cu yd

Cost = (\$12.78 /cu yd) (74.7 cu yd) = \$955

Time = (74.7 cu yd) / (35 cu yd/day) = 2.13 days

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

Volume = (74.7 cu yd) (1.3 swell factor) = 97 cu yd

Cost = (\$10.69/cu yd) (97 cu yd) = \$1,037

Time = (97 cu yd) / (232 cu yd/day) = 0.42 days

Cost Subtotal	\$8,883
Time Subtotal	17.7 days

Ditch D-8D Concrete Crossing Structure

Concrete Demolition

$$\text{Volume} = (35 \text{ ft}) (12 \text{ ft}) (0.67 \text{ ft}) = (281.4 \text{ cu ft}) / 27 = 10.4 \text{ cu yd}$$

$$\text{Cost} = (\$ 12.78/\text{cu yd}) (10.4 \text{ cu yd}) = \$ 133$$

$$\text{Time} = (10.4 \text{ cu yd}) / (45 \text{ cu yd/day}) = 0.23 \text{ days}$$

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

$$\text{Volume} = (10.4 \text{ cu yd}) (1.3 \text{ swell factor}) = 13.5 \text{ cu yd}$$

$$\text{Cost} = (\$ 10.69/\text{cu yd}) (13.5 \text{ cu yd}) = \$ 144$$

$$\text{Time} = (13.5 \text{ cu yd}) / (232 \text{ cu yd/day}) = 0.06 \text{ days}$$

Cost Subtotal \$ 277

Time Subtotal 0.29 days

Lump Coal Storage Pad

Concrete Demolition

$$\text{Wall Volume} = (38\text{ft}) (4\text{ft}) (1\text{ft}) + (80\text{ft}) (4\text{ft}) (1\text{ft}) = (472 \text{ cu ft}) / 27 = 17.5 \text{ cu yd}$$

$$\text{Slab Volume} = (38 \text{ ft}) (80 \text{ ft}) (0.67) = (2,027 \text{ cu ft}) / 27 = 75.1 \text{ cu yd}$$

$$\text{Total Volume} = 17.5 + 75.1 = 92.6 \text{ cu yd}$$

$$\text{Cost} = (\$ 12.78/\text{cu yd}) (92.6 \text{ cu yd}) = \$ 1,183$$

$$\text{Time} = (92.6 \text{ cu yd}) / (35 \text{ cu yd/day}) = 2.65 \text{ days}$$

02220-875-5550 (Concrete disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

$$\text{Volume} = (92.6 \text{ cu yd}) (1.3 \text{ swell factor}) = 120.4 \text{ cu yd}$$

$$\text{Cost} = (\$ 10.69/\text{cu yd}) (120.4 \text{ cu yd}) = \$ 1,287$$

$$\text{Time} = (120.4 \text{ cu yd}) / (232 \text{ cu yd/day}) = 0.52 \text{ days}$$

Cost Subtotal \$ 2,470

Time Subtotal 3.17 days

Equipment Wash Pad

Concrete Demolition

$$\text{Volume} = (25 \text{ ft}) (40 \text{ ft}) (0.5 \text{ ft}) = (500 \text{ cu ft}) / 27 = 18.5 \text{ cu yd}$$

$$\text{Cost} = (\$ 12.78/\text{cu yd}) (18.5 \text{ cu yd}) = \$ 236$$

$$\text{Time} = (18.5 \text{ cu yd}) / (45 \text{ cu yd/day}) = 0.41 \text{ days}$$

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

$$\text{Volume} = (18.52 \text{ cu yd}) (1.3 \text{ swell factor}) = 24.1 \text{ cu yd}$$

$$\text{Cost} = (\$ 10.69/\text{cu yd}) (24.1 \text{ cu yd}) = \$ 258$$

$$\text{Time} = (24.1 \text{ cu yd}) / (232 \text{ cu yd/day}) = 0.10 \text{ days}$$

Cost Subtotal	\$ 494
Time Subtotal	0.51 days

Transformer Pad by Shop

Concrete Demolition

$$\text{Volume} = (9 \text{ ft}) (11 \text{ ft}) (0.5 \text{ ft}) = (49.5 \text{ cu ft}) / 27 = 1.8 \text{ cu yd}$$

$$\text{Cost} = (\$ 12.78 / \text{cu yd}) (1.8 \text{ cu yd}) = \$ 23$$

$$\text{Time} = (1.8 \text{ cu yd}) / (45 \text{ cu yd/day}) = 0.04 \text{ days}$$

02220-875-5550 (Concrete Disposal on Site) 002315-400-1300 (3 CY loader) 02320-200-0320 (16 ton truck)

$$\text{Volume} = (1.8 \text{ cu yd}) (1.3 \text{ swell factor}) = 2.3 \text{ cu yd}$$

$$\text{Cost} = (\$ 10.69/\text{cu yd}) (2.3 \text{ cu yd}) = \$ 25$$

$$\text{Time} = (2.3 \text{ cu yd}) / (232 \text{ cu yd/day}) = 0.01 \text{ days}$$

Cost Subtotal	\$ 48
Time Subtotal	0.05 days

Water Tanks

Four tanks approx. 14 ft diam. x 10 ft high and one tank approx. 10 ft diam. x 20 ft high with average 3 in diam. x 1/4 in pipe top and bottom.

$$14 \text{ ft diam. tank area} = 153.9 \text{ sq ft}$$

$$10 \text{ ft diam. tank area} = 78.5 \text{ sq ft}$$

02220-100-0012 (Structure Demolition, includes disposal)

$$\text{Volume} = (10 \text{ ft}) (153.9 \text{ sq ft}) (4) + (20 \text{ ft}) (78.5 \text{ sq ft}) (1) = (7,726 \text{ cu ft}) / 27 = 286.2 \text{ cu yd}$$

$$\text{Cost} = (\$ 5.94/\text{cu yd}) (286.2 \text{ cu yd}) = 1,700$$

Assume each tank takes 1 hour

$$\text{Time} = (1 \text{ hr}) (5) = 0.625 \text{ day}$$

Cost Subtotal	\$ 1,700
Time Subtotal	0.625 days

Fuel Storage, Coal Spray and Antifreeze Tanks

- (2) Tanks approx 13.5 ft diam. x 10 ft high
- (1) Tank approx 11.5 ft diam. x 23 ft high
- (3) Tanks approx 9 ft diam. x 19 ft high
- (1) Tank approx 4 ft diam. x 11 ft long
- (1) Tank approx 7 ft diam x 7 ft high w/ 9.5 ft diam x 5 ft high outer tank
- (8) Tanks - Total

13.5 ft diam. tank area = 143.1 sq ft

11.5 ft diam. tank area = 103.9 sq ft

9 ft diam. tank area = 63.6sq ft

4 ft diam. tank area = 12.6 sq ft

7 ft diam. tank area = 38.5 sq ft

02220-100-0012 (Structure Demolition, includes disposal)

Volume = (10 ft) (143.1 sq ft) (2) + (23 ft) (103.9 sq ft) (1) + (19 ft) (63.6 sq ft) (3) + (11 ft) (12.6 sq ft) (1) + (7 ft) (38.5 sq ft) (1) = (9285 cu ft) / 27 = 343.9cu yd

Cost = (\$ 5.94/cu yd) (343.9 cu yd) = 1,364

Assume each tank takes 1 hour

Time = (1 hr) (8) = 1 day

Cost Subtotal	\$ 2,043
Time Subtotal	1.03 day

Fuel Lines

02300-900-0610 (Excavate pipeline)

Trench Length = 360 ft x 2 ft x 3.5 ft

Volume = (360 ft) (2 ft) (3.5 ft) = (2,520 cu ft) / 27 = 93.3 cu yd

Cost = (\$ 2.41/cu yd) (93.3 cu yd) = \$ 225

Time = (93.3 cu yd) / (600 cu yd/day) = 0.16 days

02220-875-3200 (Pipe Removal)

Pipe length = 400 ft x 2 pipes = 800 ft

Cost = (\$ 6.95/ft) (800 ft) = \$ 5,560

Time = (800 ft) / (160 ft/day) = 5 days

02300-900-3080 (Backfill trench)

Volume = 93.3 cu yd

Cost = (\$ 1.56/cu yd) (93.3 cu yd) = \$ 146

Time = (93.3 cu yd) / (600 cu yd/day) = 0.16 days

Cost Subtotal	\$ 5,931
Time Subtotal	5.32 days

Fans

3 Fans; below are approx dimensions for all fans.

Fan enclosure and explosion doors, $\frac{1}{8}$ in steel plate welded, approx dimensions:

- (4) 10.5 ft x 10.5 ft plate
- (2) 11 ft x 5 ft plate
- (1) $7\frac{1}{2}$ ft x 13 ft plate
- (1) 4 ft x 9 ft diam. fan
- (1) 15 ft long x 10 ft diam., taper to 9 ft diam x $\frac{3}{4}$ horn (3, 5 ft sections bolted).
- (1) 4 ft x 9 ft diam. x $\frac{3}{4}$ in ring between fan and horn

Torch cut plates, and bolts (assumed jammed)

Approx cut length = (2) (4) (10.5 ft) + (2) (2) (11 ft) + (2) (1) (13 ft) = 154 ft (2 cuts per plate) *
3 = 462 ft

02220-790-0010 (Torch Cutting, 1 in Plate)

Equivalent length (for 1 in plate) = ($\frac{1}{8}$) (462 ft) = 57.75 ft

Cutting Cost = (\$ 8.95 /ft) (57.75 ft) = \$517

Cutting Time = (57.75 ft) / (32 ft/day) = 1.8 days

Horn sections and ring bolted together with $\frac{3}{4}$ in diam bolts at 1 ft spacing.

Number of Bolts = (3 Seams) [(pi) (10 ft)] = 95 bolts

02220-790-0040 (Torch Cutting 1 in diam Bar)

Equivalent bolts (for 1 in diam) = ($\frac{3}{4}$) (95 bolts) = 72 bolts

Cutting Cost = (\$ 1.36 /bolt) (72 bolts) (3 fans) = \$294

Cutting Time = (72 bolts) / (210 bolts/day) = 0.34 days (3 fans) = 1.02 days

01590-600-2500 (Crane - 25 Ton), 01590-200-5300 (Dump Truck - 16 Ton)

Assume each piece takes 10 min. average to load with crane after cutting.

Number of pieces = 3 fans [7 plates + 1 fan + 3 horn sections + 1 ring] = 36 pieces

Time = 36 (0.17 hr) = 6.12 hrs

Crane + operator = (6.12 hrs) (\$133.72/hr) = \$818

Truck and operator + CLAB - (6.12 hr) (\$138.74) (2) = \$1,698

Time = 0.77 days

Concrete Demolition

Footing Volume = [2 (2 ft) ($7\frac{1}{2}$ ft) ($\frac{8}{12}$)] (3 fans) = 60 cu ft

Slab Volume = (13 ft) (16 ft) ($\frac{8}{12}$) (3 fans) = 416 cu ft

Volume = (60 + 416)/27 = 17.63 cu yd

Cost = (\$ 12.78 /cu yd) (17.63 cu yd) = \$ 225

Time = (17.63 cu yd) / (45 cu yd/day) = 0.39 days

02220-875-5550 (Concrete Disposal on Site), 002315-400-1300 (3 CY loader), 02320-200-0320 (16 ton truck)

Volume = (17.63 cu yd) (1.3 swell factor) = 22.9 cu yd

Cost = (\$10.69 /cu yd) (22.9 cu yd) = \$ 245

Time = (22.9 cu yd) / (232 cu yd/day) = 0.10 days

Cost Subtotal \$ 3,797

Time Subtotal 4.08 days

Structures and Conveyors (Including Loadouts)

Below are approximate average dimensions used to estimate all conveyors and support towers.
Typical conveyor truss approx 5 ft x 5 ft x 40 ft long sections with angles at corners and bar or angle cross members with 2 ft wide walkway. Some conveyors also contain an underpan approx 1/4" thick x 11 ft lineal width.

Conveyor length = 6,230 ft

Underpan length = 2,340 ft

Typical conveyor Tower.

(4) 8 in diam. x 1/4 in pipe x 60 ft high legs (average) spaced 8 ft apart with 6 in diam. x 1/4 in pipe cross members at approx 45° angle.

Number of Towers = 39

02220-100-0012 (Metal Structure Demolition, includes disposal)

Volume = (6230 ft) (5 ft) (5ft) + (60 ft) (8 ft) (8ft) (39) = (305,510 cu ft) / 27 = 11,315.2 cu yd

Cost = (\$ 5.94 / cu yd) (11,315.2) = \$ 67,212

Concrete Demolition

Volume = (39 towers + 8 ground footings) (4) (3ft) (3ft) (1ft) = (1,692 cu ft) / 27 = 62.6 cu yd

Cost = (\$ 12.78/cu yd) (62.6 cu yd) = \$ 800

Time = (62.6 cu yd) / (45 cu yd/day) = 1.39 days

02220-875-5550 (Concrete Disposal on Site), 002315-400-1300 (3 CY loader), 02320-200-0320 (16 ton truck)

Volume = 62.6 cu yd * 1.3 swell factor = 81.4 cu yd

Cost = (\$ 10.69/cu yd) (81.4 cu yd) = \$ 870

Time = (81.4 cu yd) / (232 cu yd/day) = 0.35 days

Cost Subtotal	\$ 68,882
Time Subtotal	34.44 days

Building Enclosure for Tank Seam Belt Portal

02220-100-0012 (Steel Building, includes disposal)

Volume = (12 ft) (12 ft) (8 ft) = 1,152 cu ft

Cost = (\$ 0.22/cu ft) (1,152 cu ft) = \$ 253

Time = (1,152 cu ft) / (21,500 cu ft/day) = 0.05 days

Cost Subtotal	\$ 253
Time Subtotal	0.05 days

Septic Tanks

Assume tanks will be disposed of at their current location, so removal of tanks will not be necessary.

# of Tanks:	1	Shop Building
	1	Scalehouse
	2	Bathhouse

02315-400-0260 (Excavation of Tank), 02315-900-3080 (Backfill Trench)

Tank Volume = (10 ft) (10 ft) (3 ft) (4) = (1200 cu ft) / 27 = 44.4 cu yd

Cost = (\$3.13 / cu yd) (44.4 cu yd.) = \$139

Average Time = 2 Tanks/day; Time = 2 days (concurrent with Bathhouse removal)

Concrete Demolition

Average Volume = 1.5 cu yd/Tank x 4 Tanks = 6 cu yd *

Cost = (\$ 12.78/cu yd) (6 cu yd) = \$ 77

Time = (6 cu yd) / (45 cu yd/day) = .13 days

02220-875-5550 (Concrete Disposal on Site)

Average Volume = 1.5 cu yd/Tank x 4 Tanks = 6 cu yd * 1.3 swell factor = 8 cu yd

Cost = (\$ 10.69/cu yd) (8 cu yd) = \$ 85

Time = (8 cu yd) / (232 cu yd/day) = 0.03 days

Cost Subtotal	\$ 756
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Time Subtotal	0.16 days
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Loadout Watchman's Shack

Trailer House 8 ft x 8 ft x 7 ft high

Load with crane and haul off. Assume 2 hours to load, 2 hours to haul:

02220-100-0100 (Mixed Material Building)

Volume = (8 ft) (8 ft) (7 ft) = 448 cu ft

Cost = (\$ 0.24 / cu ft) (448 cu ft) = \$108

Dump Fee = ((448 cu ft) / 27) (.3 rubble volume) (1.35 tons/cycle) (\$7.00 / ton) = \$47

Cost Subtotal	\$155
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Time Subtotal	0.5 days
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Powder and Cap Magazines

2 Steel structures: Approx. 5 ft x 6 ft x 8 ft high

Load into dumpster. Assume 15 minutes/structure

02220-100-0012 (Steel Building Demolition, includes disposal)

Volume = (5 ft) (6 ft) (8 ft) (2) = 480 ft cu ft

Cost = (480 cu ft) (\$0.22 / cu ft) = \$106

Time = 0.06 days

Cost Subtotal	\$ 106
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Time Subtotal	0.06 days
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Conveyor Belt Tunnels

6" reinforced concrete walls, roof and floor. Dimensions = 8' W x 7' H
Total length of tunnels = 470'

Concrete Demolition

Volume = (470 ft) [(7 ft) (2) + (8 ft) (2)] (0.5 ft) = 7,050 cu ft / 27 = 261 cu yd
Cost = (\$12.78/cu yd) (261 cu yd) = \$3,336
Time = (261 cu yd) / (45 cu yd/day) = 5.8 days

02220-875-5550 (Concrete Disposal on Site), 002315-400-1300 (3 CY loader), 02320-200-0320 (16 ton truck)

Volume = 261 cu yd * 1.3 swell factor = 339 cu yd
Cost = (\$10.69/cu yd) (339 cu yd) = \$3,624
Time = (339 cu yd) / (232 cu yd/day) = 1.46 days

Cost Subtotal	\$6,960
Time Subtotal	7.26 Days

Power Lines & Poles

Power Pole Removal: (50 poles)(\$100/pole) = \$5,000
Wire length: (8,700 ft) (\$11.30/100 ft) = \$983

Cost Subtotal	\$5,983
Time Subtotal	2 Days (est)

Fuel Containment Enclosure

8" reinforced concrete walls (160 ft. in length), and 6" floor.

Concrete Demolition

Volume = [(160 ft.) (2.5 ft) (.67) + (1,500 ft²) (0.5 ft)] = 1018 cu ft / 27 = 38 cu yd
Cost = (\$12.78/cu yd) (38 cu yd) = \$486
Time = (38 cu yd) / (45 cu yd/day) = 0.84 days

02220-875-5550 (Concrete Disposal on Site), 002315-400-1300 (3 CY loader), 02320-200-0320 (16 ton truck)

Volume = 38 cu yd * 1.3 swell factor = 49 cu yd
Cost = (\$10.69/cu yd) (49 cu yd) = \$528
Time = (49 cu yd) / (232 cu yd/day) = 0.21 days

Total remove structures	
Cost Total	\$ 210,403
Time Total	168.86 days

Soil Placement and Ripping

Soil Placement Volume Summary: (See Tables 3L-1 and 8.9-3)

Tank Seam Access Road & Portal Pad (TS-10 & TS-11)

See Appendix 3-H.

Cut Subtotal	20,310 cu yds
Fill Subtotal	20,310 cu yds

Upper Storage Pad (TS-8)

See Appendix 3-L, Table 3L-7

Cut Subtotal	3,666 cu yds
Fill subtotal	5,618 cu yds

Portal Pad Area & Road (TS-7)

See Appendix 3-L, Table 3L-6.

Section E-E	Cut (250 sq ft) x (340 ft) = 85,000 cu ft = 3,148 cu yds
	Fill (350 sq ft) x (340 ft) = 119,000 cu ft = 4,408 cu yds
Section F-F	Cut (450 sq ft) x (210 ft) = 94,500 cu ft = 3,500 cu yds
	Fill (450 sq ft) x (210 ft) = 94,500 cu ft = 3,500 cu yds

Cut Subtotal	6,445 cu yds
Fill subtotal	18,037 cu yds

Portal Access Road (TS-6)

See Appendix 3-L, Table 3L-5.

Section H-H	Cut (140 sq ft) x (1,500 ft) = 210,000 cu ft =	8,126 cu yds
	Fill (165 sq ft) x (1,500 ft) = 247,500 cu ft =	5,573 cu yds

Coal Storage Pad (TS-5)

See Appendix 3-L, Table 3L-4.

Cut Subtotal	40,585 cu yds
Fill Subtotal	25,157 cu yds

Scale House and Sediment Pond B (TS-3)

See Appendix 3L, Table 3L-2

Cut Subtotal	1,454 cu yds
Fill Subtotal	1,454 cu yds

Sediment Pond "A" (TS-4)

See Appendix 3-L, Table 3L-3.

Cut (350 sq ft) x (120ft) = 42,000 cu ft =	3,460 cu yds
Fill (350 sq ft) x (120ft) = 42,000 cu ft =	3,460 cu yds

Shower House and Sediment Pond C (TS-9)

See Appendix 3-L, Table 3L-8.

Cut (500 sq ft) x (185ft) = 92,500 cu ft =	5,851 cu yds
Fill (500 sq ft) x (185ft) = 92,500 cu ft =	5,851 cu yds

Wild Horse Ridge (TS-12 thru TS-15)

See Appendix 3-O, Table 3O-2, 3 & 4

Cut Subtotal =	23,641 cu yds
Fill Subtotal =	23,641 cu yds

Note: Approximately 12,500 cu yds of the Wild Horse Ridge volume will be regraded using a D9 dozer, and the remaining volume will regraded using a 330BL Excavator.

Wild Horse Ridge Tank Seam (TS-16 thru TS-17)

See Appendix 3-P.

Cut Subtotal	11,089 cu yds
Fill Subtotal	11,089 cu yds

Cut Total =	112,025 cu yds
Fill Total =	112,025 cu yds

SOIL PLACEMENT

Areas	Time	Earth		Equipment		
		Moved	Cu Yds	Used	Cost/hr	(hrs)
Tank Seam Access Road & Portal Pad (TS-10 & TS-11) Fill		Cut 20,310	20,310	330BL	\$153.13	20.2 \$ 3,093
		Hauled	10,661			
Upper Storage Pad (TS-8)	Cut	3,666 Fill	7,022	330BL	\$153.13	14.6 \$ 2,236
Portal Pad Area & Road (TS-7)		Cut Fill	6,445 18,037	330BL	\$153.13	37.7 \$5,773
Portal Access Road (TS-6)	Cut	8,126 Fill Excess Cut	5,573 2,553	330BL included in fill volumes above	\$153.13	11.65 \$ 1,784
Coal Storage Pad (TS-5)		Cut Fill Excess Cut	40,585 25,157 15,428	D9 Cat included in fill volumes above	\$190.80	50.3 \$ 9,597
Scale House/ Sed Pond B (TS-3)		Cut Fill	1,454 1,454	D9 Cat	\$190.80	2.9 \$ 553
Sediment Pond "A" (TS-4)	Cut	3,460 Fill	3,460	D9 Cat	\$190.80	6.9 \$ 1,317
Shower House/ Sed Pond C (TS-9)	Cut	5,851 Fill	5,851	D9 Cat	\$190.80	11.7 \$ 2,232
Wild Horse Ridge Area*** (TS-12 thru TS-15)	Cut	11,141 12,500 Fill	23,641	330BL D9 Cat	\$153.13 \$190.80	23.3 \$ 3,568 25.0 \$ 4,770
Wild Horse Ridge Tank Seam (TS-16 thru TS-17)	Cut	1,016	10,073	D9 Cat 330BL	\$153.13 \$190.80	1.87 \$ 286 20.1 \$ 3,835
	Fill	11,089				
Totals		Cut Fill	110,462 110,708			219.82 \$ 39,044 (27.48 days)

* See Appendix 3-L and the following page.

** Excess Cut will be hauled from TS-5 and TS-6 to TS-7 and TS-8, as discussed in Appendix 3-L.

*** Wild Horse Ridge material being relocated with the excavator will be hauled an average distance of 200 ft, as shown on the following pages.

HAULING

They will be loaded with the 330BL.

Round trip time for 1 truck = (load time) + (dump time) + 2(haul time):

330BL load time = 4 cycles * .3 min/cycle = 1.2 min.

Round trip time (with 330BL) = 1.2 + .8 + 2(haul time) = 2.0 min. + 2(haul time)

Tank Seam Access Road & Portal Pad Area

Of the total soil to be moved (20,310 cu yd) 10,661 cu yd will need to be hauled from one part of this area to another as needed.

Material will be loaded with 330BL.

Avg. haul time = 2.8 min.

Round trip time for 1 truck load (with 330BL): = 2.0 + 2(2.8) = 7.65 min.

Number of loads = 10,661 cu yd/10 cu yd truck = 1,066 loads

330BL time = (7.65 min) (hr/60 min) (1,066 loads) / 4 trucks = 34 hrs = 1.5 days

330BL cost = (\$146.92/hr) (34hrs) =

\$ 4,995

Dump Truck cost = (\$68.38/hr) (34 hrs) (4 trucks) =

\$ 9,300

\$ 14,295

Excess Cut From Coal Storage Pad and Portal Access Road to Upper Areas:

Avg. haul time = 6 min.

Round trip time for 1 truck load (980 Loader) = 2.0 + 2(6) = 6 min.

Number of loads = 18,046 cu yd / 14 cu yd truck = 1,289 loads

Hauling time = (17 min.)(hr/60 min)(1,289 loads)/14 trucks = 26.1 hrs
= 3.3 days (concurrent with soil placement)

980G EROPS (9-26) (3Q00) cost = (\$142.77/hr) (6.1 hrs) =

\$ 3,726

Dump Truck cost = (\$68.38/hr)(21.3 hrs)(14 trucks)=

\$ 24,986

\$ 28,712

Moving Excavator material for Wild Horse Ridge regrading:

Avg. Distance = 200 ft = 0.04 miles @ avg. Speed of 7 MPH; haul time = 0.34 min.

Round trip time for 1 truck load (980 Loader) = 5.88 + 2(0.34) = 6.56 min.

Number of loads = (11,141 cu yd) / (10 cu yd truck) = 1,114 loads

Hauling =(6.56 min)(hr/60 min)(1,114 loads)/(3 trucks)= 40.6 hrs = 5.1 days (concurrent w/soil placement)

Topsoil must be hauled from the storage area to the Upper Conveyor Access Road and the Portal Pad:

2,171 cu yds will be hauled an average distance of 2,000 ft. (60)(0.38 miles)/(7 MPH) = 3.25 min.

4,860 cu yds will be hauled an average distance of 4,500 ft. (60)(0.85 miles)/(7 MPH) = 7.29 min.

Round trip 1 = 5.88 + 2(3.25) = 12.38 min.; Number of loads = (2,171 cu yd)/(10 cu yd truck) = 217 Loads

Hauling = $(12.38 \text{ min})(\text{hr}/60 \text{ min})(217)/(3 \text{ trucks}) = 14.9 \text{ hrs} = 1.9 \text{ days}$ (concurrent w/soil placement)
 Round trip 2 = $5.88 + 2(7.29) = 20.46 \text{ min.}$; Number of loads = $(4,860 \text{ cu yd})/(10 \text{ cu yd truck}) = 486$
 Loads
 Hauling = $(20.46 \text{ min})(\text{hr}/60 \text{ min})(486)/(3 \text{ trucks}) = 55.2 \text{ hrs} = 6.9 \text{ days}$ (concurrent w/soil placement)

980 loader cost = $(\$142.77/\text{hr})(40.6 + 14.9 + 55.2 \text{ hrs}) =$	\$15,805
Dump Truck cost = $(\$68.38/\text{hr})(40.6 + 14.9 + 55.2 \text{ hrs})(3 \text{ trucks}) =$	\$23,788
	\$39,593

Moving Excavator material for WHR Tank Seam regrading.

Avg. Distance = 390 ft = 0.07 miles @ avg. Speed of 7 MPH; haul time = 0.49 min.
 Round trip time for 1 truck load (980 Loader) = $5.88 + 2(0.49) = 6.86 \text{ min.}$
 Number of loads = $(10,095 \text{ cu yd}) / (10 \text{ cu yd truck}) = 1,110 \text{ loads}$
 Hauling = $(6.86 \text{ min})(\text{hr}/60 \text{ min})(1,110 \text{ loads})/(3 \text{ trucks}) = 42.3 \text{ hrs} = 5.3 \text{ days}$ (concurrent w/soil placement)

980 loader cost = $(\$142.77/\text{hr})(42.3 \text{ hrs}) =$	\$6,039
Dump Truck cost = $(\$68.38/\text{hr})(42.3 \text{ hrs})(3 \text{ trucks}) =$	\$8,677
	\$14,716

Cost Subtotal	\$ 97,316
Time Subtotal	9.9 days

Hauling Material to Fill Borehole

10,560 cu yd will need to be hauled from the Blind Canyon Seam portal.
 Round trip time:
 Loader haul time = 0.3 miles @ 7 mph x 2 loads = 5.14 min. to haul
 Loader cycle time = 2 cycles/(106 cycles/hr) = 1.13 min. to load
 Truck haul time = 1.1 miles @ 7 mph = 9.43 min.
 Total cycle time = 15.70 min.
 Number of loads = $10,560 \text{ cu yd}/10 \text{ cu yd truck} = 1,056 \text{ loads}$
 980 Loader time = $(15.7 \text{ min})(\text{hr}/60 \text{ min})(1,056 \text{ loads})/13 \text{ trucks} = 21.2 \text{ hrs.}$
 = 2.65 days (concurrent with soil placement)

CAT 330BL cost = $(\$153.13/\text{hr})(21.2 \text{ hrs}) =$	\$3,384
980 Loader cost = $(\$142.77/\text{hr})(21.2 \text{ hrs}) =$	\$3,027
Dump Truck cost = $(\$68.38/\text{hr})(21.2 \text{ hrs})(13 \text{ trucks}) =$	\$18,846
	\$ 25,257

Cost Subtotal	\$ 25,257
Time Subtotal	2.65 days

Soil Placement Cost Subtotal =	\$ 39,044
Hauling Excess Cut Cost Subtotal =	\$ 97,316
Filling Borehole Cost Subtotal =	\$ 25,257

Cost Total	\$178,617
Time Total	36.2

d. Channel Restoration

EXCAVATION OF RECLAIMED CHANNELS								
Channel	Channel Length ¹ (ft)	Channel Area ² (sq ft)	Channel Volume (cu yd)	Culvert Diam. (in)	Culvert Length (ft)	Culvert Area (sq ft)	Culvert Volume (cu yd)	Excavated Volume (cu yd)
RC-1	320	42	498	N/A				498
RC-2	640	64.5	1,529	30 18	150 350	4.9 1.77	27 23	1,479
RC-3	1,030	64.5	2,461	18	200	1.77	13	2,448
RC-4	160	39	231	12	170	0.79	5	226
RC-5	165	30	183	12	170	0.79	5	178
RC-6	25	48	44	--	--	--	--	44
RC-7	80	238	705	36 120	80 80	7.1 78.5	21 233	451
RC-8	50	192	356	30	50	4.9	9	347
RC-9	510	204	3,853	30	510	4.9	93	3,844
RC-10	160	255	1,511	60	160	19.63	116	1,395
RC-11	40	32	47	18	40	1.77	3	44
RC-12	230	36	<u>307</u>	--	--	--	<u>—</u>	<u>307</u>
Totals			11,725				563	11,261
Notes:	1	See plates 7-8A, 7-8B.						
	2	See appendix 7-H.						

022 254 1320 Excavation

Volume = 11,269 cu yds

Time = 11,269 cu yds / (330 cu yd/hr) = 34.14 hrs = 4.3 days

Cost = (11,269 cu yd) (\$11.56/cu yd) = \$130,270

RCP Culverts (RC-10):

Concrete Demolition

Volume = $\pi(5 \text{ ft})(4/12)(140 \text{ ft}) = 733 \text{ cu ft} / 27 = 27.15 \text{ cu yd}$

Cost = (\$12.78 /cu yd) (27.15 cu yd) = \$347

Time = 27.15 cu yd / (45 cu yd/day) = 0.60 days

02220-875-5550 (Concrete Disposal on Site)

002315-400-1300 (3 CY loader)

02320-200-0320 (16 ton truck)

Volume = (27.15 cu yd) (1.3 swell factor) = 35.3 cu yd

Cost = (\$10.69/cu yd) (35.3 cu yd) = \$ 377

Time = 35.3 cu yd / (232 cu yd/day) = 0.15 days

Cost Subtotal	\$130.994
Time Subtotal	5.05 days

RIP RAP VOLUME SUMMARY

Reclaimed Channel	Reclaimed Length ¹ (ft)	Rip Rap Area ² (sq ft)	Rip Rap Volume (cu yd)
RC-1	320	24.1	376
RC-2	640	34.0	806
RC-3	1,030	34.0	1,297
RC-4	160	21.4	127
RC-5	165	16.4	100
RC-6	25	10.7	10
RC-7	80	131.4	389
RC-8	50	105.5	195
RC-9	510	112.3	2,121
RC-10	160	152	901
RC-11	40	10.7	16
RC-12	230	19.9	169
RC-RD2	950	4.5	158
RC-RD4	730	4.5	122
RC-RD8	1,010	3.9	146
RC-RD9	650	4.5	108
RC-RD12	300	1.4	15
RC-RD13	380	1.4	20
RC-RD20	329	0.6	7
RC-RD21	186	0.2	<u>1</u>
Total			7,084

Notes: 1 See plates 7-7, 7-7A, 7-8A, 7-8B.
 2 See appendix 7-H.

022 712 0100 Riprap machine placed for slope protection

Total volume = 7,084 cu yd

Cost = (\$38.5 /cu yd) (7,084 cu yd) = \$272,734

Time = (7,084 cu yd) / (62 cu yd/day) = 114.3 days

e. Revegetation

Hydroseeding (Section 9.5)

C0150256 (Hydro Spreader)

Area = 38.3 acres = 1,669 MSF

Cost = (\$19.85/MSF) (1,669 MSF) = \$33,130

C0150255 (Tractor Spreader)

Area = 38.3 acres = 1,669 MSF

Cost = (\$10.28/MSF) (1,669 MSF) = \$17,157

C0150251 (Seed Material)

Area = 38.3 acres

Cost = (\$974.10/acre) (38.3) = \$37,308

C0150253 (Hydromulch)

Area = 38.3

Cost = (\$410.25/acre) (38.3) = \$15,712

C0150252 (3,704 Seedlings)

Cost = (\$0.77 each) (3834) = \$2,952

02370-550-0120 Install Matting (Section 9.5)

Cost = (\$7.5 sys) (29,040) = \$ 217,800

02315-400-0260 (Pocking)

Cost = (\$1.56/cu yd) (29,689 cu yd) = \$46,315

Assume 25% reseeding = \$92,594

Time = (38.3 acres) / (4 acres/day) = 9.58 days

Cost Total \$462,968

Time Total 9.58 days

f. Monitor Well Plugging

Assume \$5,000 per well

The above listed costs include reclamation costs added between 1985 and the latest modification.